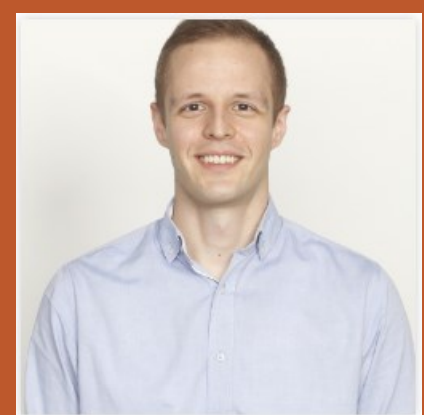# An analysis of COFOG expenditures in former Yugoslavian countries

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An analysis of COFOG expenditures in former Yugoslavian countries

Agenda:

1. Introduction

2. Evolution of public expenditure

3. Sensitivity of public expenditure to the economic cycle

4. Determinants of expenditure composition

5. Conclusion

1. Introduction

- As of 2019, Former Yugoslavian countries were all at different stages of the process of integration into the European Union (EU).

Pre-candidate	Candidate	EU member	Eurozone member
• Bosnia and Herzegovina (2007)	• North Macedonia (2005) • Montenegro (2010) • Serbia (2012)	• Croatia (2013)	• Slovenia (2007)

- We consider the possibility of comparing evolutions from a common starting point, the dissolution of former Yugoslavia, as a type of natural experiment

- Assess whether the policies would converge or diverge post secession

- Aim to provide conclusions explaining the fiscal behavior
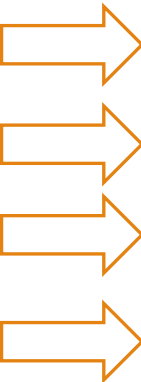
1. Introduction

- Several contributions to literature on fiscal topics in the former Yugoslavian countries:

- Budget elasticity in relation to the economic cycle. The focus was on the main aggregates - public deficit, revenues, and expenditures. Fiscal policies are driven by the spending component. (Crnogorac and Lago-Peñas, 2019a)

- Quantified estimates of tax evasion using shadow economy data and tax gaps (Crnogorac and Lago-Peñas, 2019b)

- Determinants of tax morale as factors explaining tax evasion (Crnogorac and Lago-Peñas, 2020)

1. Introduction

- Lack of publicly available data on COFOG categories in Western Balkan countries

- Deal with the main fiscal aggregate, expenditures

- Cross-country perspective instead of focusing on single country issues

- 3 objectives:

  1) Explore if common patterns in spending exist among the sample countries

  2) Analyze the impact of the economic cycle on overall public expenditures and each of their COFOG categories

  3) Discover the economic and political determinants of the composition of public expenditures such as business cycles, electoral cycles, and decentralization

2. Evolution of public expenditure

- The Classification of the Functions of Government (COFOG) by the United Nations (2000) is a current functional disaggregation of total general government expenditures into 10 categories

- Former Yugoslavian countries were included in studies as part of wider samples: 155 countries in Afonso and Jalles (2014); Slovenia and Croatia in other cross-sectional studies (Hessami, 2014; del Granado, Martinez-Vazquez and McNab, 2018)

- COFOG data sample of six former Yugoslavian countries between 2011 and 2019

- Several complementary analyses to analyse the evolution of expenditures:

    1) Descriptive analysis of expenditure composition (Ex-Yu vs. EU15)

    2) Cluster analysis (Ex-Yu vs. EU13)

    3) Convergence analysis of former Yugoslavian countries (concept of β-convergence)

2.1 Descriptive analysis of expenditure composition

Expenditure categories as a share of total expenditures in 2019, former Yugoslavian countries vs core EU countries (EU-15), %
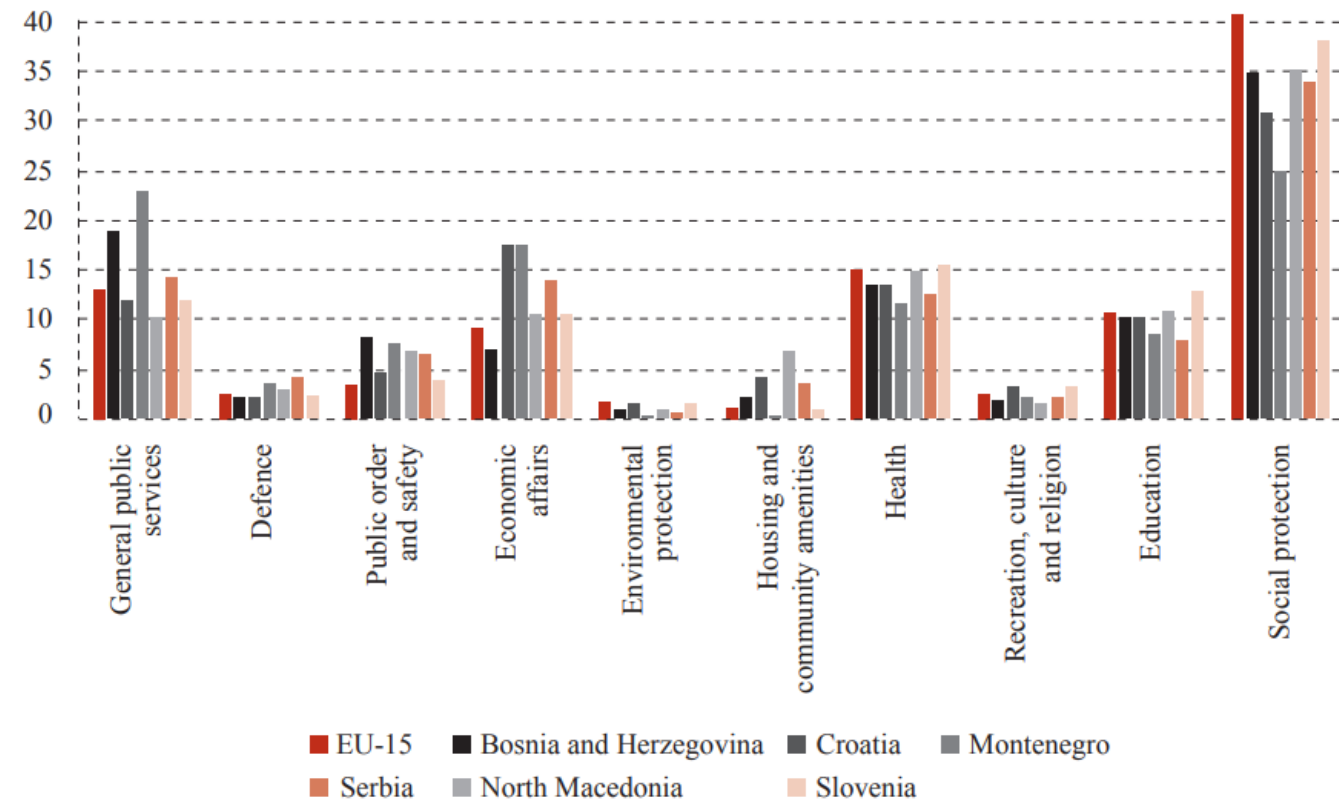
- Social Protection expenditures are below the EU-15 average

- Health expenditures, at EU-15 average

- Bosnia and Herzegovina, Montenegro, and Serbia deviate from the core EU in terms of General Public Affairs and Education expenditures

- All countries except BiH, exceed the EU-15 average in terms of Economic Affairs spending

- Overspending in Public Order and Safety in all countries except Slovenia

2.2 Cluster analysis

Dendrogram of cluster analysis for 2019
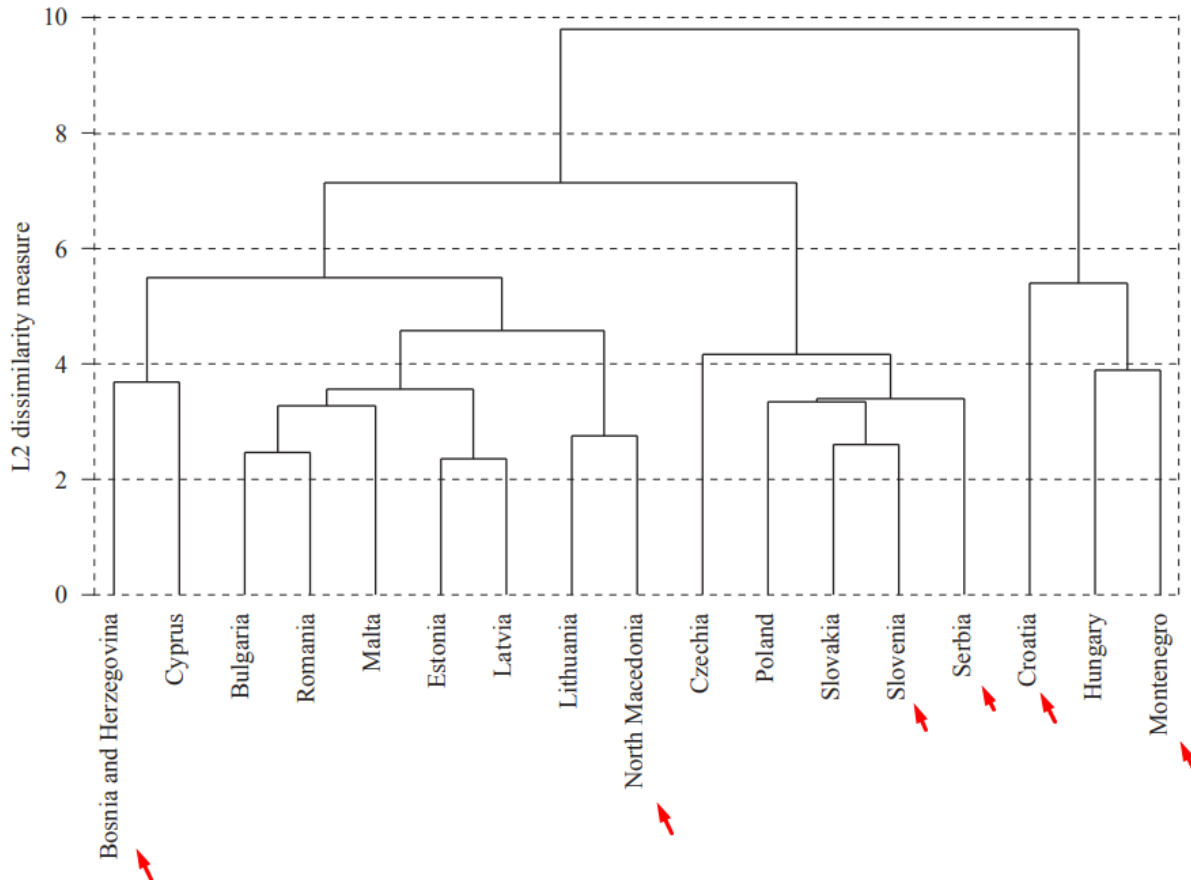
- Two cluster analyses for 2011 & 2019

- Joined with new EU member states (EU13)

- Former Yugoslavian countries are not grouped in one specific cluster

- The differences in expenditures composition do not decrease or increase over time

2.3 Convergence analysis

β-convergence in public expenditure

	Total expenditures	General public services	Defence	Public order and safety	Economic affairs	Environmental protection
Intercept	4.35 (1.55)	0.77 (1.8)*	0.22 (2.47)**	0.13 (1.18)	2.96 (3.93)***	0.05 (1.55)
E_{t-1}	-0.11 (1.67)	-0.11 (1.8)*	-0.21 (2.92)***	-0.06 (1.6)	-0.54 (4.25)***	-0.16 (2.21)**

	Housing and community amenities	Health	Recreation, culture and religion	Education	Social protection
Intercept	0.04 (0.61)	0.95 (2.28)**	0.08 (2.11)**	0.17 (0.92)	0.84 (1.47)
E_{t-1}	-0.04 (0.75)	-0.17 (2.35)**	-0.1 (2.98)***	-0.06 (1.36)	-0.07 (1.74)*

Obs.: 53; Method: OLS.

*Note: ***, **, * indicate statistical significance at 1%, 5% and 10%, respectively. T-statistics computed using OLS residuals is reported in parenthesis.*

- β-convergence of EX-Yu sample solely

$$E_t - E_{t-1} = \alpha + \beta \times E_{t-1} + \varepsilon_t$$

- Statistically significant convergence in seven categories

- Overall government expenditures are convergent at a marginal significance

- Limited convergence of expenditures

3. Sensitivity of public expenditure to the economic cycle

- Fiscal policies tend to be countercyclical in industrial (developed) countries

- Studies show that in developing countries, fiscal policy is often shown to be procyclical
  - Effect is driven by expenditures rather than revenues

- In Crnogorac and Lago-Peñas (2019a) the expenditures have been shown to be countercyclical

- Panel dataset is unbalanced: 2005-2019, annual data

- Methodology: POLS and GMM, performed with EViews 9.5

$$E_t = \alpha_i + \beta \times output\ gap_{it} + \rho \times E_{t-1} + \varepsilon_{it}$$

- E - category of expenditure analysed; α - country fixed effects, β - coefficient of the independent variable, ρ_i - coefficient of the lagged dependent variable, and ε_{it} is the random error

- Output gap was computed using the Hodrick-Prescott filter $$output\ gap = \left(\frac{GDP\ Series}{filtered\ GDP\ Series} - 1\right) * 100$$

3. Sensitivity of public expenditure to the economic cycle

- Several specification tests were performed on both estimates to check the robustness of the results to potential endogeneity of the output gap.

- OLS
  - Redundancy of individual and period fixed effects → F statistic
  - Wald test → Cross-section slope homogeneity indicates no cross-country homogeneity
  - Pesaran-CD → Error component is not cross-sectionally correlated, confirming the specification
  - The Breusch-Godfrey test (AR 1) → No autocorrelation in the OLS estimate

- GMM
  - Hansen and the Arellano-Bond AR(2) → No autocorrelation in the GMM estimate

Results table, part 1 of 3

- Ratio of expenditures to GDP is negatively influenced by the economic cycle

	Total expenditures		General public services		Defence		Public order and safety	
Method	**OLS**	**GMM**	**OLS**	**GMM**	**OLS**	**GMM**	**OLS**	**GMM**
Output gap	-0.55 (-3.01)***	-0.67 (-4.11)***	-0.12 (-1.56)	-0.14 (-2.28)**	0.02 (1.4)	0.03 (1.49)	-0.02 (-1.24)	-0.03 (-2.41)**
Lagged endogenous	0.37 (3.11)***	0.33 (7.33)***	0.5 (4.73)***	0.66 (3.71)***	0.77 (10.21)***	0.74 (7.84)***	0.63 (6.55)***	0.61 (3.14)***
R2	0.85		0.87		0.82		0.93	
Individual fixed effects	Yes (0.0009)		Yes (0.008)		Yes (0.0717)		Yes (0.0297)	
Period fixed effects	No		No		Yes (0.0772)		No	
Wald	0.0118							
Pesaran CD	0.1350							
B-G test	0.8532							
Hansen test		0.3052		0.6803		0.6356		0.7494
A-B AR(2)		0.3101		0.6226		0.1620		0.1576
Observations	64	58	64	58	64	58	64	58

Results table, part 2 of 3

- GMM estimates support the OLS results.

Method	Economic affairs		Environmental protection		Housing and community amenities	
	OLS	GMM	OLS	GMM	OLS	GMM
Output gap	-0.07 (-0.48)	0.06 (0.51)	0.002 (0.22)	0.001 (0.15)	-0.01 (-0.45)	0.01 (0.27)
Lagged endogenous	0.2 (1.59)	0.1 (0.68)	0.24 (2.16)**	0.48 (3.09)***	0.35 (3.13)***	0.3 (1.79)*
R2	0.45		0.88		0.94	
Individual fixed effects	Yes (0.0128)		Yes (0.0000)		Yes (0.0000)	
Period fixed effects	No		No		No	
Hansen test		0.8943		0.0810		0.1551
A-B AR(2)		0.2414		0.2150		0.8262
Observations	64	58	64	46	64	58

Results table, part 3 of 3

- Output gap is significant in only three COFOG categories (Health, Education, and Social Protection)
  - Social Protection → decreases when the output gap is positive, since employment is higher in good economic times.
  - Health and Education → Healthcare and education systems imply the existence of long-term strategies that do not sustain frequent changes.

Method	Health		Recreation, culture and religion		Education		Social protection	
	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
Output gap	-0.07 (-2.57)**	-0.1 (-5.61)***	-0.004 (-0.33)	-0.01 (-2.7)**	-0.03 (-1.68)*	-0.03 (-2.23)**	-0.21 (-3.65)***	-0.27 (-1.96)*
Lagged endogenous	0.42 (3.56)***	0.12 (0.82)	0.59 (5.08)***	0.34 (4.04)***	0.72 (9.04)***	0.74 (14.52)***	0.5 (4.45)***	0.23 (0.86)
R^2	0.79		0.92		0.94		0.93	
Individual fixed effects	Yes (0.0029)		Yes (0.0513)		Yes (0.0484)		Yes (0.0051)	
Period fixed effects	No		No		No		No	
Hansen test		0.2843		0.0921		0.0662		0.4226
A-B AR(2)		0.1292		0.3618		0.5178		0.1556
Observations	64	58	64	46	64	58	64	46

4. Determinants of expenditure composition

- Existing literature:
  - Endogenous variables as a share of total expenditures or GDP
  - Most of the papers focus on one or several variables of interest, such as corruption, decentralization, GDP, or electoral and political variables.
  - Concerning control variables, the most usual are ageing, population size, unemployment rate, and total expenditures

- Our estimate:
  - Dependent variable → category over GDP
  - Independent variables → Social expenditure (Health; Recreation, culture, and religion; and Social protection); Productive expenditure (Economic affairs and Education)
  - Determinants → Election year, Party nationalization index, Corruption perception index, GDP (EUR)
  - Controls → trade openness, unemployment rate, total expenditures

Determinants of COFOG expenditures

	SE	PE
C	12.8484	-32.065
	(2.1)**	(-3.2)***
	[1.67]	[-2.62]**
ELECTIONS	0.498	-0.3541
	(2.25)**	(-0.98)
	[2.09]**	[-0.83]
PARTY_NAT	16.8527	-4.8893
	(3.49)***	(-0.62)
	[3.21]***	[-0.56]
CORRUPT	-0.3769	0.2448
	(-1.2)	-0.48
	[-1.13]	[0.46]
GDPEUR	-0.0001	0.0001
	(-1.66)	-0.92
	[-1.88]*	[1.28]
OPEN	-0.8379	0.1487
	(-0.39)	-0.04
	[-0.38]	[0.05]
UNEM	-0.1432	0.2187
	(-3.05)***	(2.84)***
	[-3.17]***	[2.46]**
TOTEXP	0.0992	0.8844
	(2.09)**	(11.39)***
	[1.94]*	[10.77]***
Observations	70	70
Individual fixed effects	>0.0001	>0.0001
Period fixed effects	>0.0001	0.003
B-G test	0.66	0.16
R-squared	0.97	0.91

- Social expenditures are increased during electoral cycles.

- Decentralization affects social expenditures positively

- Negative influence of GDP on social expenditures

- Trade openness has a positive effect on productive expenditures

- The unemployment rate is relevant in explaining productive spending

- Social and productive expenditures are positively influenced by the growth of the share of total expenditure in GDP

5. Conclusion

- Built a homogeneous dataset of all six former republics

- Public expenditures in these countries between 2011 and 2019 diverge in terms of dynamic, static, and structural aspects

- Public spending was countercyclical in all former Yugoslavian countries
  - Health, Education, and Social Protection expenditures driving the results
  - Role of automatic stabilizers, discretionary expenditure programmes due to crisis and rigidity of expenditures

- Social expenditures are increased in election years and in less diverse party systems; and decreased in a booming economy, characterised by a growing GDP and shrinking unemployment.

- Productive expenditures are increased when unemployment is high, in order to combat recessions

Thank you for your attention!